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METHOD OF MANUFACTURING OPTICAL SURFACES OF REVOLUTION. (U)
FEB 82 V V GORELIK, S I DENISOV

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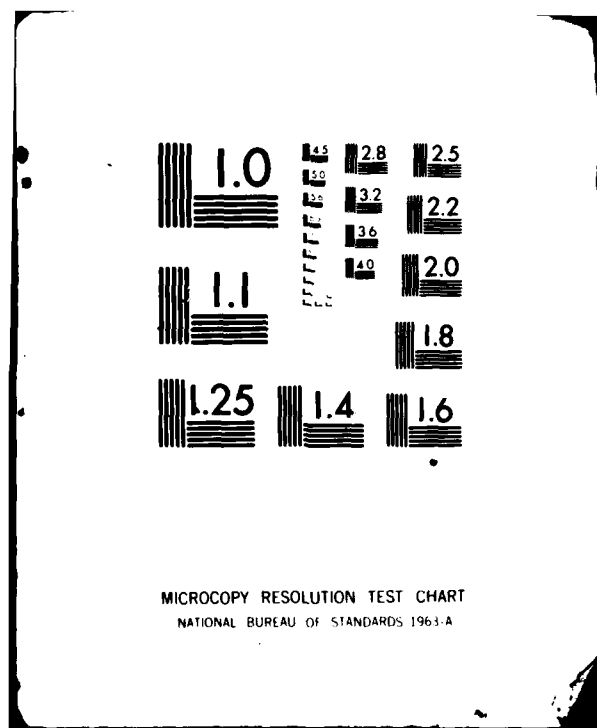
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METHOD OF MANUFACTURING OPTICAL SURFACES OF REVOLUTION

by

V.V. Gorelik and S.I. Denisov



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EDITED TRANSLATION

FTD-ID(RS)T-1731-81

3 February 1982

MICROFICHE NR: FTD-82-C-000147

METHOD OF MANUFACTURING OPTICAL SURFACES OF REVOLUTION

By: V.V. Gorelik and S.I. Denisov

English pages: 3

Source: USSR Patent Nr. 315569, 1 October 1971, pp. 1-2

Country of origin: USSR

Translated by: Carol S. Nack

Requester: USAMICOM

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PREPARED BY:

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WP.AFB, OHIO.

FTD-ID(RS)T-1731-81

Date 3 Feb 1982

U. S. BOARD ON GEOGRAPHIC NAMES TRANSLITERATION SYSTEM

| Block | Italic | Transliteration | Block | Italic | Transliteration |
|-------|------------|-----------------|-------|------------|-----------------|
| А а | <i>А а</i> | A, a | Р р | <i>Р р</i> | R, r |
| Б б | <i>Б б</i> | B, b | С с | <i>С с</i> | S, s |
| В в | <i>В в</i> | V, v | Т т | <i>Т т</i> | T, t |
| Г г | <i>Г г</i> | G, g | У у | <i>У у</i> | U, u |
| Д д | <i>Д д</i> | D, d | Ф ф | <i>Ф ф</i> | F, f |
| Е е | <i>Е е</i> | Ye, ye; E, e* | Х х | <i>Х х</i> | Kh, kh |
| Ж ж | <i>Ж ж</i> | Zh, zh | Ц ц | <i>Ц ц</i> | Ts, ts |
| З з | <i>З з</i> | Z, z | Ч ч | <i>Ч ч</i> | Ch, ch |
| И и | <i>И и</i> | I, i | Ш ш | <i>Ш ш</i> | Sh, sh |
| Й й | <i>Й й</i> | Y, y | Щ щ | <i>Щ щ</i> | Shch, snch |
| К к | <i>К к</i> | K, k | Ъ ъ | <i>Ъ ъ</i> | " |
| Л л | <i>Л л</i> | L, l | Ы ы | <i>Ы ы</i> | Y, y |
| М м | <i>М м</i> | M, m | Ь ь | <i>Ь ь</i> | ' |
| Н н | <i>Н н</i> | N, n | Э э | <i>Э э</i> | E, e |
| О о | <i>О о</i> | O, o | Ю ю | <i>Ю ю</i> | Yu, yu |
| П п | <i>П п</i> | P, p | Я я | <i>Я я</i> | Ya, ya |

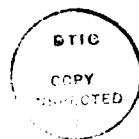
*ye initially, after vowels, and after ъ, ь; e elsewhere.
When written as ë in Russian, transliterate as yë or ë.

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

| Russian | English | Russian | English | Russian | English |
|---------|---------|---------|---------|---------|--------------------|
| sin | sin | sh | sinh | arc sh | sinh ⁻¹ |
| cos | cos | ch | cosh | arc ch | cosh ⁻¹ |
| tg | tan | th | tanh | arc th | tanh ⁻¹ |
| ctg | cot | cth | coth | arc cth | coth ⁻¹ |
| sec | sec | sch | sech | arc sch | sech ⁻¹ |
| cosec | csc | csch | csch | arc sch | csch ⁻¹ |

Russian English

| | |
|-----|------|
| rot | curl |
| lg | log |



METHOD OF MANUFACTURING OPTICAL SURFACES OF REVOLUTION

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This invention is in the area of the technology of manufacturing optical parts with a second-order surface of revolution.

We know of a method of manufacturing second-order optical surfaces of revolution by grinding and polishing the blank using a tubular tool with a scarf. The main drawback of this method of manufacture is the immobility of the working edge of the tubular tool.

In order to increase the precision of machining and work productivity, the blank is machined on an elliptical trajectory.

The figure shows a tool for carrying out this method.

The blank 1 is fastened on chuck 2 so that its axis coincides with the axis of rotation of spindle 3. The tool 4 is mounted on lever 5 of the machine tool and fastened in the initial position for machining the surface. Then the dogs 6 with the working parts 7 of tool 4 attached to them are abutted against the surface of blank 1 being machined. In order to obtain different types of surfaces, the calibration plate 8 of the tool is inclined at the necessary angle to its axis, thereby assigning the required slope of the "scarf" over which the working parts 7 come into contact with the surface being machined.

Metal working parts are used for grinding, while either a layer of resin is applied to the working edge, or else felt is attached.

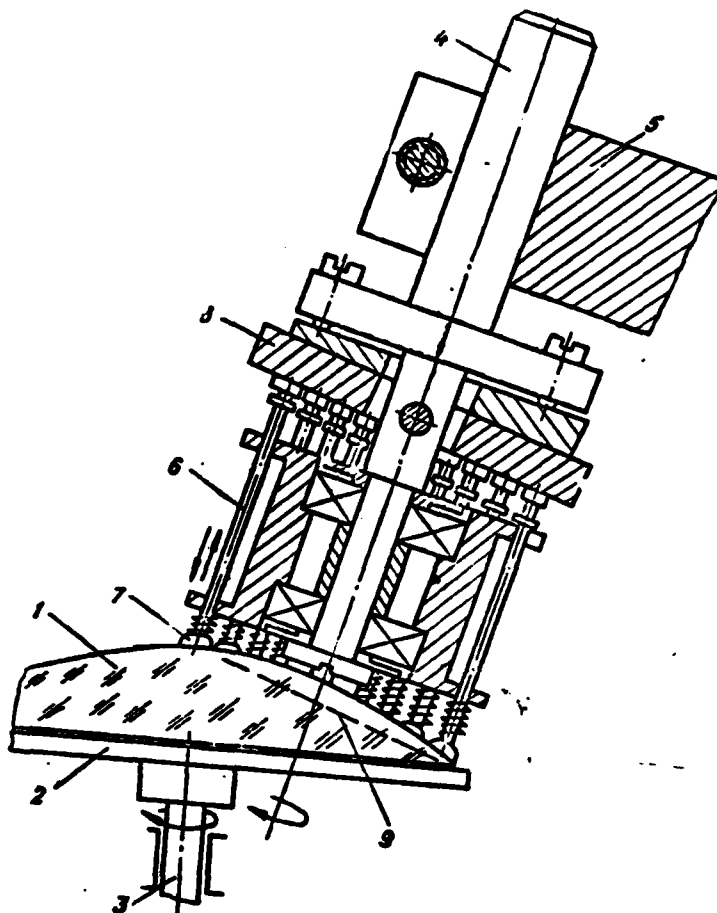


Figure.

Machining is done with an abrasive, and the working parts of the tool are moved over the surface being machined on an elliptical trajectory 9, while the dogs which hold the working parts simultaneously convey backward-forward motion along the axis of the tool, i.e., along the forming cylinder (wall) of the tubular tool. This is accomplished by transferring the rotation from the blank to the tool through the contact of the working parts with the surface being machined and by the interaction of the dogs with the calibration surface, as well as by the interaction of the dogs with the calibration plate with which the forming process is carried out. The

rotational motion of the tool can be conveyed from the drive.

Subject of Invention

This invention is a method of manufacturing optical surfaces of revolution, primarily of second order, by grinding and polishing the blank with a tubular tool with a scarf. It is different because in order to increase the precision of machining and work productivity, the blank is machined on an elliptical trajectory.

